

## Course Outcomes Guide (COG)

**Course Title: Contemporary Issues in Biology, BIO 111**

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### **STUDENT LEARNING OUTCOMES:**

- Students will access, process, analyze and synthesize scientific information.
- Students will apply knowledge of specific course content to build an understanding of biotechnological issues.
- Students will apply the scientific method and critical thinking skills in order to draw logical conclusions based on the analysis of scientific data.
- Students will use technology by applying computer and information literacy skills to access online learning materials and conduct online research.
- Students will use verbal and writing skills to discuss their personal ethical values, and present factual information which can be used to justify their philosophical positions on controversial issues.

### **COURSE CONTENT OBJECTIVES:**

- Utilize fundamental vocabulary related to biotechnology.
- Identify and describe basic concepts of biotechnology and related scientific principles.
- Discuss applications of biotechnology and their use and impact in society, including but not limited to economics, law, health/medicine and diversity.
- Discuss ethical issues related to biotechnology in society, including pros & cons and basic concepts needed for citizens to develop informed opinions.

**Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)**

**Grades were determined based on the following assignments (accelerated 10 week course):**

- Weekly Discussions Posts – Best 7 of 9 @ 10 points each (70 points) – required students to research and discuss topic related to weekly topic and respond to peer posts.
- Lecture Quizzes (Best 5 of 6 @ 20 points each (100 Points) – Mixture of multiple choice, true/false, matching and short answer/essay questions directly relate to weekly topics.
- Research Presentation & Post (50 points) – students submit an article or related topic for approval and are required to create a 10 slide (minimum) presentation based on the topic & related data. This is posted as a presentation and students must then answer questions and respond to peer postings as part of the grade.
- General education Assessment (25 points) – Multiple choice, multiple answer/ matching type online assessment based on interpreting scientific data related to topics covered throughout the course.
- Exams (255 points) – three 85-point exams were given, including the final exam. Mixture of multiple choice, true/false, matching and short answer/essay questions directly

relate to weekly topics. Exams included critical thinking and data analysis type questions as well as opinion/ (pro vs. con) and defense of opinion to assess communication skills as well as critical thinking, informational literacy and diversity as it related to topics covered in the course.

**Validation (What methods have you used or will you use to validate your assessment?)**

- Quiz questions (all non- essay/short answer) were available immediately after the attempt with feedback. This allowed students to review material in order to clarify any misconceptions and provide students with timely feedback. Essay/short answer questions that were manually graded were available after grading with feedback as necessary.
- Exams were set-up the same way as quizzes – with the exception that the right answer and full-feedback was not available until after the exam period ended (to prevent sharing of information).
  - Some questions for quizzes & exams were used/modified in collaboration with other relevant courses that had similar topics (Biotechnology, BIO 113, Cell Biology & Microbiology)
- Discussion posts were graded based on the following criteria/rubric
  - Up to 5 points for your initial post, with your opinion, and supporting data or information.
  - Up to 3 points for responding to at least one other person's post - to include positive comments and constructive rebuttal.
  - Up to 2 points for writing in complete sentences, using proper grammar and including citations for works cited.
- Presentation topic is graded using a rubric provided to students when assigned. Students had approximately 4-6 weeks to work on this and submit for feedback before the final submission.

**Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)**

The exams were not cumulative – they were broken down into units

<b>Student</b>	<b>Exam #1 Grade (%)</b>	<b>Exam #2 Grade (%)</b>	<b>Final Exam Grade (%)</b>	<b>Gen Ed Assessment Grade (%)</b>	<b>Walk Away F</b>
<b>1</b>	<b>55</b>	<b>92</b>	<b>77.1</b>	<b>91.6</b>	
<b>2</b>	<b>84</b>	<b>95.5</b>	<b>97.2</b>	<b>94</b>	
<b>3</b>	<b>67</b>	<b>92.6</b>	<b>84.7</b>	<b>78</b>	
<b>4</b>	<b>80</b>	<b>94.3</b>	<b>95.8</b>	<b>96</b>	
<b>5</b>	<b>94</b>	<b>97.1</b>	<b>97.2</b>	<b>96</b>	
<b>6</b>	<b>86</b>	<b>95.5</b>	<b>91.7</b>	<b>0</b>	
<b>7</b>	<b>90</b>	<b>90.9</b>	<b>97.9</b>	<b>94</b>	
<b>8</b>	<b>82</b>	<b>97.7</b>	<b>79.2</b>	<b>74.8</b>	
<b>9</b>	<b>92</b>	<b>100</b>	<b>99.3</b>	<b>90</b>	
<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>F</b>
<b>11</b>	<b>84</b>	<b>90.2</b>	<b>86.1</b>	<b>0</b>	
<b>12</b>	<b>84</b>	<b>69.1</b>	<b>69.4</b>	<b>83.6</b>	

<b>13</b>	<b>90</b>	<b>94.3</b>	<b>91.7</b>	<b>87.6</b>	
<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>F</b>
<b>15</b>	<b>77</b>	<b>92.1</b>	<b>77.8</b>	<b>63.2</b>	
<b>16</b>	<b>62</b>	<b>80</b>	<b>78.5</b>	<b>90</b>	
<b>17</b>	<b>100</b>	<b>97.7</b>	<b>98.6</b>	<b>100</b>	
<b>Average</b>	<b>72</b>	<b>76.61</b>	<b>73.46</b>	<b>67</b>	

**Follow-up (How have you used or how will you use the data to improve student learning?)**

Students seemed to struggle with the written essays for each exam. One way to see if learning improved would be to have written assignments throughout the course, just not on exams. Also, the current book had no online resources or instructor's manual. The course committee could work to further develop standard materials or find a text that had online resources (like homework, videos/animations) to help student engagement and retention.

**Budget Justification (What resources are necessary to improve student learning?)**

None at this time – potentially materials for demonstrations – use materials or example already purchased for other courses like BTC 101, BO 117 etc.